Cyberknife

Intracranial Robotic Radiosurgery

The Cyberknife Robotic Radiosurgery System (Accuray) is a non invasive method for delivering radiation with pin-point accuracy. In selective cases, it offers an alternative to surgery when surgery is not possible.

What is Stereotactic Radiosurgery (SRS)?

Stereotactic radiosurgery is a form of radiation therapy which delivers a high energy radiation beam to cancer cells or abnormal tissues with surgical precision. It is named Radiosurgery but there is no cutting involved. Typically these are given in 1 to 5 treatments**.**

Stereotactic radiosurgery is an important alternative to invasive surgery, especially for tumors and blood vessel abnormalities located deep within or close to vital areas of the brain.
This procedure does not remove the tumor or lesion. Instead, it destroys tumor cells or stops the growth of abnormally active tissue.

What is the Cyberknife system?

The Cyberknife is a machine designed specifically for SRS treatment. It can reduce or eliminate certain lesions and tumors, many previously considered inoperable. It can also offer significantly fewer complications and lower risk than open surgery.

The range of motion offered by the robotic arm gives it ability to reach tumor sites not accessible by other means. It delivers high doses of radiation with pin-point, sub-millimeter accuracy. Because this system can deliver radiation beams from virtually any direction, the radiation beams are focused precisely on the tumor, minimizing damage to the surrounding healthy tissue and critical structures. This is combined with equipment to track the target's position during treatment and detect patient or tumor movement. The system can automatically correct for these changes during treatment. The Cyberknife system can be used to treat cancerous and non-cancerous tumors anywhere in the body, including the brain, spine, lung, liver, pancreas and kidney.

Is this treatment invasive?

The treatment itself is entirely non-invasive. There are no needles or metal head frames required. Best of all, it achieves surgical-like outcomes without anesthesia or incisions.

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Robotic Radiosurgery - Benefits

- Pain free
- Non-invasive
- No anesthesia required
- Outpatient procedure, between 1 and 5 sessions
- No invasive body or head frame required
- No breath holding required
- Accurate, safe delivery of high dose of radiation
- Immediate return to normal activities

What is the process?

1. **Consult** – You will meet with a Radiation Oncologist and Neurosurgeon who specialize in SRS in order to discuss the treatment. They will determine if this treatment is appropriate for you, and provide you with all treatment options.
2. **Scanning and Simulation** – Prior to treatment, additional scans such as an MRI or will likely be required. The MRI is typically done at Redwood City. You will also have a CT scan done in our office. At this appointment, you have a custom mask made to ensure an accurate and reproducible position. This appointment is called a Simulation, but is not an actual treatment. These scans together determine the exact size and location of the target.
3. **Planning** – after the scanning is complete, the information is sent to the Cyberknife treatment planning computer. The radiation oncologist and neurosurgeon will identify the target to be treated. A qualified physicist will then develop a plan to treat the target as prescribed by the physician while minimizing dose to surrounding normal structures. This process can take between 1 and 10 days. The patient is not present for this step.
4. **Treatment** – During a Cyberknife treatment, you will be lying comfortably on the treatment table. The daily set up is performed by a radiation therapist. The therapist will be outside of the treatment room during radiation delivery, but will be monitoring the treatment remotely. The patient can communicate via an intercom and is monitored by video camera. The machine will track the target motion throughout the process. Anesthesia is not used, as the treatment is painless. Treatments typically last between 30 and 90 minutes and are completed in one to five sessions.
5. **Follow up** – As needed, follow up imaging will be arranged to monitor the response of the target to the delivered radiation. This may include repeat CT, MRI or PET scans. As treatment response takes time, these scans generally are scheduled months after treatment.

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